

Amendments to the Claims:

Please cancel claims 1-37 as presented in the underlying International Application No. PCT/EP03/01749.

Please add new claims 38-77 as indicated in the listing of claims below.

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-37 (canceled)

Claim 38 (new): A method for grinding and polishing free-form surfaces using at least one tool, the method comprising:

calculating a virtual removal of a preprocessed optical surface having an initial shape sufficient to achieve a desired shape;

dividing the optical surface into a plurality of subareas;

calculating a zeroth order approximation for estimating a mutual interaction for each adjacent subarea of the plurality of subareas;

calculating a dwell time of the at least one tool for each of the plurality of subareas using a linear system of equations, the calculating taking into account the respective mutual interaction and at least one of a contact pressure, a speed of rotation, and a behavior of a polishing agent of the at least one tool; and

controlling each of the at least one tool for each subarea so as to remove material from the optical surface in accordance with the virtual removal, wherein the controlling of the tool is performed by controlling at least one of the contact pressure, the speed of rotation, the dwell time, and a movement of the at least one tool.

Claim 39 (new): The method as recited in claim 38, wherein the preprocessed optical surface includes a rotationally symmetric aspherical optical surface.

Claim 40 (new): The method as recited in claim 39, wherein the rotationally symmetric

aspherical optical surface includes at least one of a lens and a mirror.

Claim 41 (new): The method as recited in claim 38, wherein the preprocessed optical surface is pre-grinded.

Claim 42 (new): The method as recited in claim 38, wherein the calculating of the virtual removal is performed using interferometrical measurement and comparison of the initial shape to the desired shape.

Claim 43 (new): The method as recited in claim 38, wherein a size of each of the plurality of subareas corresponds to a size of the at least one tool.

Claim 44 (new): The method as recited in claim 38, wherein a size of each of the plurality of subareas corresponds to double a size of the at least one tool.

Claim 45 (new): The method as recited in claim 38, wherein the controlling of the at least one tool is performed by varying the dwell time.

Claim 46 (new): The method as recited in claim 38, wherein the controlling of the at least one tool is performed by varying the speed of rotation.

Claim 47 (new): The method as recited in claim 38, wherein the controlling of the at least one tool is performed by varying a speed of rotation of the optical surface.

Claim 48 (new): The method as recited in claim 38, wherein the controlling of the at least one tool is performed by varying the contact pressure.

Claim 49 (new): The method as recited in claim 38, wherein the controlling of the tool is performed so as to remove only the minimally necessary material for a correction of the surface.

Claim 50 (new): The method as recited in claim 39, wherein the virtual removal is transferred to an one-dimensional form, and lens is rotating during the grinding and polishing.

Claim 51 (new): The method as recited in claim 38, wherein the controlling of the at least one tool is performed only once and a total processing time of less than about ten minutes.

Claim 52 (new): The method as recited in claim 38, further comprising controlling each of the at least one second tool after the controlling of each of the at least one tool, wherein each of the at least one second tool is smaller than each of the at least one tool.

Claim 53 (new): The method as recited in claim 38, wherein the plurality of subareas do not overlap with one another.

Claim 54 (new): The method as recited in claim 38, wherein the plurality of subareas overlap with one another.

Claim 55 (new): The method as recited in claim 54, wherein the plurality of subareas overlap substantially.

Claim 56 (new): The method as recited in claim 38, wherein the plurality of subareas exhibit different sizes.

Claim 57 (new): An aspherical glass lens having an accuracy better than 600 nanometers, grinded and polished within about 20 minutes according to the method recited in claim 38.

Claim 58 (new): An aspherical glass lens having an accuracy better than 600 nanometers and a concave surface, grinded and polished using a BestFit radius of curvature of less than 50 mm within a time of about 40 minutes according to the method recited in claim 38.

Claim 59 (new): A correction tool for the processing of rotationally symmetric free-form surfaces according to the method recited in claim 38, wherein the correction tool is rotatable and radially moveable, and wherein a ratio of the size of the tool and the diameter of free-form surface is between one eighth and one quarter.

Claim 60 (new): A tool for the processing of rotationally symmetric free-form surfaces according to the method as recited in claim 38, wherein the tool is rotatable and radially

moveable, and wherein a size of the tool is twice as wide as the narrowest mountain of errors on the free-form surface to be removed.

Claim 61 (new): The correction tool as recited in claim 59, further comprising a polishing or grinding foil including a homogeneous material.

Claim 62 (new): The correction tool as recited in claim 61, wherein the homogeneous material is free of bubbles and indentations.

Claim 63 (new): The correction tool as recited in claim 61, wherein the tool includes a plurality of indentations from a working surface of the tool having steep edges with respect to the working surface, the indentations for supplying at least one of a polishing agent and a cooling agent.

Claim 64 (new): An arrangement comprising a plurality of the tools as recited in claim 19 for simultaneously processing a first surface of the free-form surface.

Claim 65 (new): The arrangement as recited in claim 64, wherein each of the plurality of tools is disposed perpendicularly with respect to the optical surface.

Claim 66 (new): The arrangement as recited in claim 64, wherein each of the plurality of tools moves on a radial line of a rotationally symmetric free-form surface.

Claim 67 (new): The arrangement as recited in claim 64, wherein each of the plurality of tools moves on a non-radial line of the free-form surface.

Claim 68 (new): The arrangement as recited in claim 64, wherein each of the plurality of tools does not move on the free-form surface.

Claim 69 (new): The arrangement as recited in claim 64, wherein each of the plurality of tools are arranged on the free-form surface in such a way that, in case of a rotating free-form surface, the entire free-form surface is processed.

Claim 70 (new): The arrangement as recited in claim 64, wherein the first surface amounts is

more than five percent of the free-form surface.

Claim 71 (new): The arrangement as recited in claim 64, wherein the plurality of tools are controlled separately.

Claim 72 (new): The correction tool as recited in claim 59 further comprising a movable foot at a processing side of the tool, wherein the foot orients itself such that the tool overlies the free-form surface tangentially.

Claim 73 (new): The arrangement as recited in claim 64, wherein the plurality of tools are available in compounds.

Claim 74 (new): The arrangement as recited in claim 73, wherein the compounds are rod-shaped.

Claim 75 (new): The arrangement as recited in claim 73, wherein the compounds are round.

Claim 76 (new): The arrangement as recited in claim 73, wherein the compounds are positioned across the free-form surface and moved as a single tool.

Claim 77 (new): The method as recited in claim 38, further comprising a subsequent polishing of the free-form surface, wherein the polishing preserves or improves an accuracy of the free-form surface.